The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte KAZUNARI HONMA and SHIGEHARU MATSUSHITA

Appeal No. 2006-3405
Application No. 10/631,858

ON BRIEF

Before BLANKENSHIP, MACDONALD, and HOMERE, Administrative Patent Judges.

BLANKENSHIP, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal under 35 U.S.C. § 134 from the examiner's final rejection of claims 1 and 4-10.

We reverse.

BACKGROUND

The invention relates to a dielectric device in which constituent elements in an electrode surface layer that abuts a dielectric film are terminated by halogen (fluorine) atoms. According to appellants, the arrangement provides for superior characteristics with respect to dielectric devices in the prior art. Claim 1, the sole independent claim on appeal, is reproduced below.

1. A dielectric device comprising:

such a first electrode layer that constituent elements located on its surface are terminated by halogen atoms; and

a dielectric film formed on the surface of said first electrode layer terminated by said halogen atoms,

wherein said first electrode layer contains at least one element selected from a group consisting of Pt, Ir, Pd and Ru and said halogen atoms are fluorine atoms.

The examiner relies on the following references:

Fukaya et al. (Fukaya)	US 4,581,099	Apr. 8, 1986
Yamazaki et al. (Yamazaki)	US 6,046,469	Apr. 4, 2000
Kirlin et al. (Kirlin)	US 6,320,213 B1	Nov. 20, 2001
Hwang et al. (Hwang)	US 6,323,132 B1	Nov. 27, 2001
Nakamura	US 6,783,998 B2	Aug. 31, 2004
Furukawa[1]	JP 11-068057	Mar. 9, 1999

[1] With English language abstract and computer-generated English translation of entire document.

We refer to the Final Rejection (mailed Jun. 13, 2005) and the Examiner's Answer (mailed May 9, 2006) for a statement of the examiner's position and to the (substitute) Brief (filed Aug. 10, 2006) and the Reply Brief (filed Jul. 7, 2006) for appellants' position with respect to the claims which stand rejected.

Claims 1, 4-7, and 8 stand rejected under 35 U.S.C. § 103 as being unpatentable over Nakamura and Fukaya.[2]

Claim 7 stands rejected under 35 U.S.C. § 103 as being unpatentable over Nakamura, Fukaya, and Furukawa.

Claim 9 stands rejected under 35 U.S.C. § 103 as being unpatentable over Nakamura, Fukaya, and Yamazaki.

Claim 10 stands rejected under 35 U.S.C. § 103 as being unpatentable over Nakamura, Fukaya, Yamazaki, and Kirlin.[3]

Claims 2 and 3 have been canceled. Claims 11-21 have been withdrawn from consideration.

OPINION

In the rejection of instant claim 1 over Nakamura and Fukaya, the examiner finds that Nakamura shows (e.g., col. 4, ll. 36-67 and Fig. 1(a)) most aspects of the invention,

---

[2] The Answer (at 3) contends that canceled claims 2 and 3 are also rejected.

[3] Yamazaki perhaps has been applied against claim 10 but, contrary to the indication at page 5 (part 5) of the Answer, the rejection against base claim 1 does not rely on Yamazaki.

but does not "explicitly" show the first electrode surface terminated by the fluorine atoms. The rejection turns to Fukaya (col. 4, l. 64 - col. 5, l. 2), and finds that the reference teaches that etching with halogen atoms, such as fluorine, terminates the material being etched. It would have been obvious, according to the rejection, to terminate the surface of the first electrode of Nakamura since Fukaya teaches that etching with halogen atoms, such as fluorine, terminates the material being etched. (Answer at 3-4.)

Appellants argue that while Fukaya discloses an electrode exposed to fluorine, Fukaya fails to teach or suggest that the electrode contains at least one element selected from the group consisting of Pt, Ir, Pd, and Ru that is terminated by fluorine. We find that Fukaya teaches, in the section relied upon in the rejection, termination of dangling bonds by halogen atoms such as fluorine remaining on the surface of "a-Si photoconductive layer" during plasma etching. We do not find a response to appellants' argument in the Answer.

Appellants also argue that in the examples described in Nakamura to implement patterning (col. 4, ll. 42-48), the surface of the "first electrode layer" as claimed -- or the upper surface of layer 1 as shown in Figure 1(a) of the reference -- would not be exposed during the patterning and thus would not be terminated by fluorine atoms.

The examiner responds that Nakamura leaves the choice of patterning up to one of ordinary skill in the art, and that two of three ways that Nakamura describes for patterning can be done with exposure of the upper surface to the etchant. The

examiner refers to Hwang[4], which describes removing a mask during etching of a platinum electrode layer at column 6, lines 26 to 32, and to Fukaya, which teaches removing a photoresist layer (i.e., a mask) before etching at column 3, lines 42 to 48. According to the examiner, either way that is taught by Hwang or Fukaya would expose the surface of the layers to the etchants. (Answer at 6.)

We agree with appellants, for substantially the reasons expressed in the briefs, that the rejection fails to establish a prima facie case of obviousness with respect to the subject matter of claim 1. Even assuming that the processes identified in Hwang and Fukaya, if applied to Nakamura, would expose the upper surface layer of the electrode to gases during etching steps in Nakamura, the rejection does not show why the references would have suggested that the artisan apply the requisite teachings of Hwang or Fukaya to Nakamura.

Moreover, Nakamura teaches the avoidance of a particular problem in the prior art; i.e., the problem that when using a mask 23 for forming an electrode by carrying out patterning with etching (sputtering), burrs 22a are formed on both sides of the mask and on outer surfaces of metal layer 22. Nakamura col. 1, l. 46 - col. 2, l. 10; Figs. 2(a) - 2(c). Nakamura describes processes whereby dry-etching may be carried out such that no burrs are formed on the sides of a mask or the side walls of the resulting electrode (e.g., col. 6, ll. 27-40; col. 7, ll. 43-46, col. 10, ll. 37-51; claim 1, wherein "no

[4] Cf. In re Hoch, 428 F.2d 1341, 1342 n.3, 166 USPQ 406, 407 n.3 (CCPA 1970) ("Where a reference is relied on to support a rejection, whether or not in a 'minor capacity,' there would appear to be no excuse for not positively including the reference in the statement of rejection.").

formation of side walls occurs."). Consistent with appellants' position, we find no suggestion for the artisan to investigate ways in which masks might be avoided for the etching of the layers shown in Figure 1(a), when Nakamura describes (1) the use of masks during prior art etching steps and (2) how to avoid the drawbacks known to be associated with the use of masks during the etching process.

Thus, while the rejection at best shows that Nakamura could be modified in accordance with the requirements of instant claim 1, the rejection fails to show why the prior art would have suggested that the artisan do so. Prior art references in combination do not make an invention obvious unless something in the prior art would suggest the advantage to be derived from combining their teachings. In re Sernaker, 702 F.2d 989, 995-96, 217 USPQ 1, 6-7 (Fed. Cir. 1983). Here, the rejection seems based on assumptions of what might happen if certain events were to occur.

The remainder of the references applied in combination against the claims depending from claim 1 do not remedy the deficiencies in the rejection applied against the independent claim. We thus do not sustain the rejection of any of the claims on appeal.

CONCLUSION

The rejection of claims 1 and 4-10 under 35 U.S.C. § 103 is reversed.

REVERSED

HOWARD B. BLANKENSHIP)
Administrative Patent Judge)
)
)
)
) BOARD OF PATENT
ALLEN R. MACDONALD) APPEALS
Administrative Patent Judge) AND
) INTERFERENCES
)
)
JEAN R. HOMERE)
Administrative Patent Judge)

ARENT FOX KINTNER PLOTKIN & KAHN, PLLC
Suite 400
1050 Connecticut Avenue, N.W.
Washington, DC 20036-5339